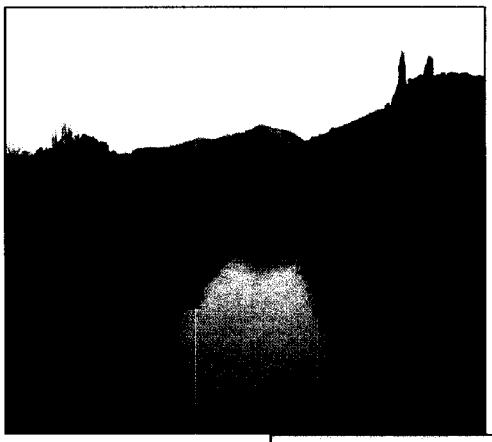
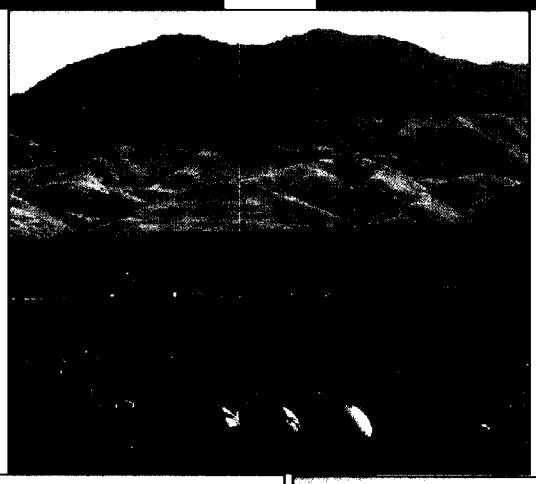
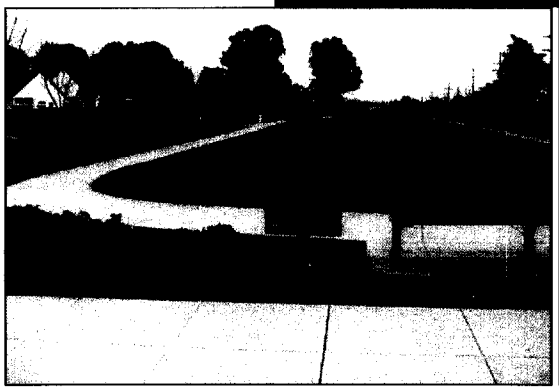
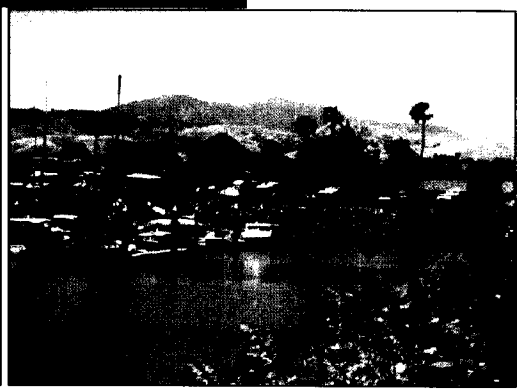
CITY OF PITTSBURG

2005 URBAN WATER MANAGEMENT PLAN









CITY OF PITTSBURG

2005 URBAN WATER MANAGEMENT PLAN

City Council

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Prepared pursuant to California Water Code Division 6, Part 2.6. Urban Water Management Planning
Sections 10610 through 10656

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Executive Summary

Background And Purpose

Enacted in 1983, the Urban Water Management Planning Act (Act) requires every urban water supplier providing water to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt an Urban Water Management Plan every five years. The City of Pittsburg Water System, a water retailer, fits the defined criteria and has prepared this Urban Water Management Plan (Plan) to address all requirements set forth in the State of California Water Code Section 10610 through 10657.

Since its passage, 18 amendments have been added to the Act. These changes are intended to encourage increased regional planning and the cooperative management of California's most precious commodity - water. As a result, Urban Water Management Plans have evolved to become:

- foundation documents and sources of information for Water Supply Assessments (*California Water Code* Section 10613) and Written Verifications of Water Supply (*California Water Code* Section 66473.7);
- long-range planning documents for water supply;
- source data for the development of regional water plans;
- source documents for cities and counties preparing their General Plans;
- key components of Integrated Regional Water Management Plans; and
- a condition to qualify for receipt of certain State grant funds.

For the city of Pittsburg (City), the benefits of updating our Plan extends beyond legislative compliance. The regional approach of documenting water-service planning allows the city to:

- evaluate supply-reliability goals for the City and provide a comprehensive assessment of water resource needs in its service area;
- provide a perspective on current and proposed water use efficiency programs and identify measures that can be implemented in a cost effective manner;
- identify opportunities and challenges to maximize the beneficial use of recycled water and other local water resources that reduce the need for imported supplies of water; and
- offer opportunities for public participation through publicly-noticed meetings and provide information that will allow the public to gain a better understanding of the region's comprehensive water planning.

The 2005 Urban Water Management Plan for the city of Pittsburg is an update to the Plan adopted by the Pittsburg City Council in December 2000 and is prepared in compliance with the California Urban Water Management Act as amended, also referred to as AB797. Under AB797, any supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually is required to review, amend, and adopt its urban water management plan at least once every five years. The Plan documents the City's planning activities to ensure adequate water supplies are available to meet existing and future demands for water. The 2005 Plan was prepared to satisfy the Act, as amended.

The Plan presents both forecasts of water supplies and water demands and describes the City's water demand management and recycled water opportunities to the year 2030. This five-year

update of the Plan incorporates the recommendations of the City's principal water supplier, the Contra Costa Water District (CCWD), as detailed in their Future Water Supply Study adopted August 1996, the Future Water Supply Implementation Environmental Impact Report certified February 1999, and CCWD's own 2005 Urban Water Management Plan. The Plan also presents a water shortage contingency analysis and a description of the Plan adoption, public coordination, and planning coordination activities.

Forecast of Supply and Demand Reliability

The City is within the Contra Costa Water District (CCWD) service area and obtains 85% to 95% of its water supply from CCWD pursuant to a contractual arrangement allowing the City to obtain such quantity of water as is necessary to meet its needs, subject to rationing restrictions in the event of drought or other extraordinary circumstances. The City obtains 5% to 15% from the groundwater wells located in the city of Pittsburg.

The supply and demand forecast presented in the Plan indicates that the City does not anticipate supply deficits in normal years due to stability of the raw water supply. CCWD has indicated that current demands can be met under all supply conditions. Starting in 2010, during the second and third year of a multi-year drought, short-term water purchases would most likely need to be reduced by 5% to 15% (see Table 5-3). CCWD has further indicated that it believes the maximum amount of short-term conservation expected to be necessary under drought conditions would be 15% of demand.

Wastewater Management and Water Recycling

This Plan documents wastewater collection, treatment, recycling, and disposal in the City's service area. Currently, the region collects an estimated 15,200 acre-feet of wastewater per year. Approximately 45% of that wastewater is currently used for recycled supply for industrial customers. The remaining wastewater is disposed through a river outfall. It is expected that the amount of recycled water used will increase in the future.

Water Quality

All of CCWD's intakes are subject to variations in water quality caused by salinity intrusion, Delta hydrodynamics, and discharges into the Delta and its tributary streams from both point and non-point sources. Since 1992, CCWD has spent over $850 million on capital improvements, including $450 million on the Los Vaqueros Project, in an effort to ensure stability in water quality.

CCWD is implementing a comprehensive water quality strategy to protect and improve source water quality for its customers. CCWD's multi-pronged approach includes seeking improved water quality sources, reducing impacts of Delta agricultural drainage on source water quality, participating in collaborative research on advanced water treatment of Delta water, and supporting regulatory and legislative initiatives for improving drinking water quality and source water protection.

Impact of Water Quality on Water Service Reliability

Water quality evaluation is based on known contaminants applicable to local and imported supplies by three levels of standards:

- Primary Drinking Water Standards (health);
- Secondary Drinking water Standards (aesthetics);
- Notification Levels (not yet regulated contaminants).

The city of Pittsburg does not anticipate that any water quality issues would reduce supply availability or could not be handled through existing management strategies. However, unforeseeable environmental problems, such as a Delta levee failure, could potentially alter the region's water supply characteristics and adversely impact service and water quality reliability.

Water Demand Management Measures and Water Conservation Program

As a signatory to the California Urban Water Conservation Council's Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) the City is allowed to file a water conservation "Best Management Practices" report with the CUWCC. This has been deemed as meeting the reporting requirements for the demand management section of the plan.

The City cooperates with CCWD in providing various water conservation programs to the Pittsburg community. These efforts include:

1. Water survey program for single-family and multi-family customers.
2. Residential plumbing retrofit programs in conjunction with the water survey program.
3. Water audits for larger landscape and commercial accounts.

As a wholesaler, CCWD develops and implements regional conservation programs on behalf of its retail water agencies and their customers. This regional approach enables economies of scale, ensures a consistent message to the public, and assists in the acquisition of grant funding for program implementation.

Water Shortage Contingency Plan

During water shortages, CCWD manages its water supply to ensure it meets the demands of its own retail customers and member agencies. Water shortages may result form variations in weather, natural disasters, or unanticipated situations (i.e. systems failures, acts of terror, etc.). During a severe water shortage, CCWD would be responsible for allocating its imported water supply. Water supply to the city of Pittsburg would be supplemented by the City's groundwater sources.

Coordination

It is important to note that CCWD and its retail member agencies, including the city of Pittsburg are also required to prepare Urban Water Management Plans and are doing so simultaneously. As a result, the City recognizes that close coordination between CCWD and its retail member agencies is the key to the success of its Plan.

The City's Plan is meant to aggregate the planning information in a meaningful way so the public can better understand water resource planning on the regional level. Every effort has been made to coordinate information with CCWD and other retail agencies' plans as they were being prepared to avoid any significant discrepancies in facts, figures, and estimates contained in each local Urban Water Management Plan. To that end, much of the information presented in this Plan is based on the best available information at the time of drafting

Plan Adoption

In compliance with California Water Code Section 10644(b), the City is required to file this Plan with the Department of Water Resources on or before December 31, 2005, or as per Section 10656 "An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding ... or receive drought assistance from the state until the urban water management plan is submitted..."

Section 1

Introduction and Public Participation

Law

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a Plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published... After the hearing, the Plan shall be adopted as prepared or as modified after the hearing.

10642(d)(2). Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding ... or receive drought assistance from the state until the urban water management plan is submitted...

1.1 Introduction

This Urban Water Management Plan was prepared and adopted pursuant to the Urban Water Management Planning Act (Act). The Act became part of the California Water Code (Section 10610 through 10656) with the passage of Assembly Bill 797 during the 1983-84 regular session of the California legislature. The Act originally required preparation of a 1985 Urban Water Management Plan. It was subsequently amended to require that each urban water supplier providing municipal water to more than 3,000 customers or supplying more than 3,000 acre-feet annually must prepare an updated plan every five years. The city of Pittsburg (City) is an urban water supplier as defined by Section 10617 of the Act.

When preparing this Act, the California Legislature found that "the conservation and efficient use of urban water supplies are of statewide concern; however, the Planning for that use and the implementation of those plans can best be accomplished at the local level." The focus of this document is the planning and efficient use of water supplies by and for the City.

This document presents the City's 2005 Urban Water Management Plan (Plan). This Plan is organized according to subject as recommended by the State of California Department of Water Resources, with water code sections included as appropriate.

1.2 Previous Reports

Several reports have been prepared which address the city of Pittsburg's growth and related water supply and demand for the City's water system, and for the Contra Costa Water District, which provides most of the City's water supply. These include:

- Water System Master Plan – Amendment no.1 (adopted December 2001).
- Water System Master Plan – Amendment no. 2 (Southwest Hills - adopted August 2004).

- Contra Costa Water District Urban Water Management Plan (December 2005).
- City of Pittsburg 2000 General Plan (last amended December 2004).
- Pittsburg/DDSD Recycled Water Project Facilities Plan (March 2005).
- Future Water Supply Study 1996 - Contra Costa Water District and Future Water Supply Study 2002 Update, 2002 (FWSS).

1.3 Public Participation and Plan Adoption

A draft of this Plan was circulated to parties known to the City that may have an interest in the Plan. Notice of the Public Hearing to review the Draft Urban Water Management Plan on February 21, 2006, was published twice in the Contra Costa Times, East County edition which is a major local newspaper of general circulation in the City's service area. The notice also advised the public that copies of the Plan were available for review at the Pittsburg Public Library and City Public Works' office prior to the hearing and that written comments could be sent to the City until February 16, 2006.

The City Council of the City of Pittsburg adopted the Urban Water Management Plan at their regular meeting on _____, 2006.

Notice of the Public Hearing and the Resolution adopting the Plan are included in Appendix D.

1.4 Agency Coordination

The city of Pittsburg has coordinated its Plan preparation with other appropriate agencies in the area, as required by law. The City has actively participated for many years in integrated water resource planning for east Contra Costa County.

Water agencies, wastewater agencies, flood control districts, and watershed management groups within the eastern portion of Contra Costa County (East County) have a long history of cooperative planning for the region. In the early 1990s, the following agencies joined together as the East Contra Costa Water Managers Association and undertook an East County Water Supply Management Study, a comprehensive water management plan:

- City of Antioch
- City of Brentwood
- Byron-Bethany Irrigation District
- Town of Discovery Bay Community Services District (formerly Contra Costa County Sanitation District No. 19)
- Contra Costa County Water Agency
- Contra Costa Water District
- Delta Diablo Sanitation District
- Diablo Water District
- East Contra Costa Irrigation District
- Ironhouse Sanitary District
- City of Pittsburg

This group continues to coordinate on water management issues for the region, holding regular meetings. In July 2005, this group prepared a Functionally Equivalent Integrated Regional Water Management Plan for the East Contra Costa region; tying together the following regional water management plans:

- *Phase II East County Water Supply Management Study*, 1996 (ECWSMS). Developed by eleven East County agencies, it is a comprehensive regional assessment of water demands and supplies, treatment and delivery options, water supply alternatives, and recommendations and implementation strategies for regional water management.

- *Stormwater Management Plan*, 1999 (SWMP). Developed by Contra Costa County in conjunction with the Contra Costa Flood Control and Water Conservation District and local cities and districts, serves as the basis for the Contra Costa Clean Water Program's National Pollutant Discharge Elimination System (NPDES) Permit application to the Central Valley and San Francisco Bay Regional Water Quality Control Boards.

- *Future Water Supply Study Final Report*, 1996, and *Future Water Supply Study* 2002 Update, 2002 (FWSS). The Future Water Supply Study (updated in 2002) contains a detailed analysis of the future supply and water needs for the Contra Costa Water District service area, including Eastern Contra Costa County.

Copies of the City of Pittsburg Urban Water Management Plan were sent to the agencies shown in Table 1-1.

Table 1-1
Coordination and Public Involvement Actions

Agency	Contacted for Assistance	Sent Copy of Draft Plan	Commented on Draft Plan	Sent Notice of Intention to Adopt
Contra Costa Water District	X	x		
Delta Diablo Sanitation District	X	x		
Pittsburg Public Library		x		

Section 2

Service Area Characteristics

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631(a.) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

2.1 Service Area Description

Pittsburg was established along the Suisun Bay/Delta shoreline as a 10,000-acre land grant from the government of Mexico in 1839 and grew into a settlement. Originally named New York of the Pacific, the name was changed to New York Landing during the Gold Rush, and then to Pittsburg in 1911.

The City is located in the eastern portion of Contra Costa County, about 40 miles northeast of San Francisco. Originally a coal shipping port, the City was founded in 1849, and incorporated in 1903 as a general law city. In the 1940s and early 1950s, the City was a major commercial and industrial center for the County and the eastern ports of the greater San Francisco Bay Area. Pittsburg experienced rapid population growth during the 1970s and 1980s, evolving into a bedroom community for employment centers in west and central Contra Costa County. Today the City is part of the second largest industrial center in the County and has a population of approximately 62,605 as of January 1, 2005.

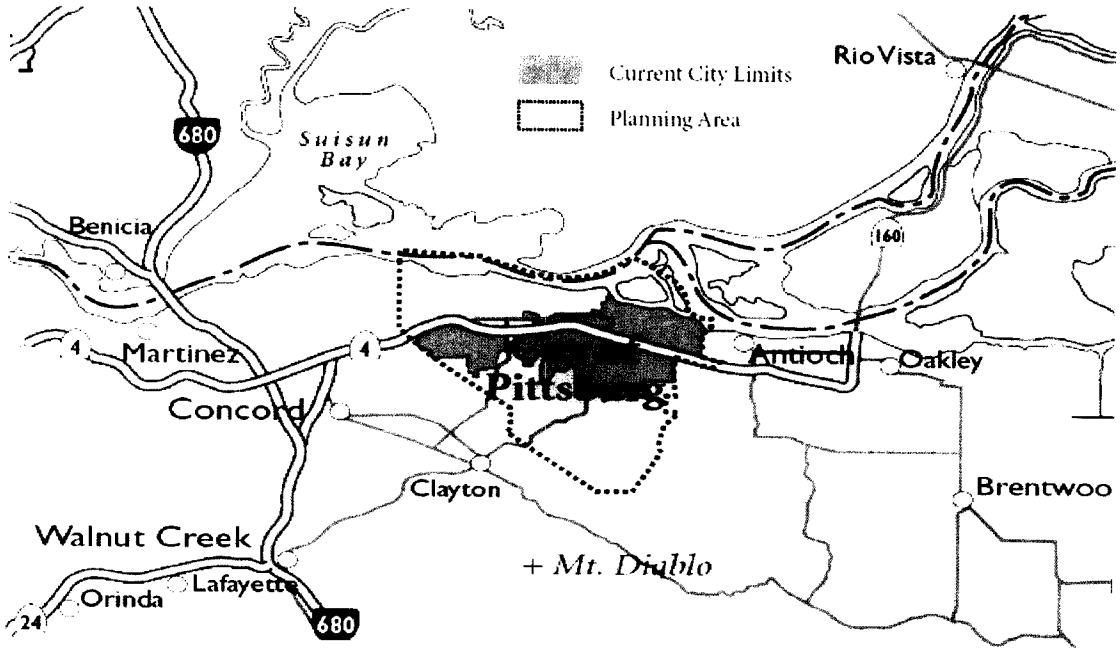
The Pittsburg Planning Area comprises a total of 26,960 gross acres (42.1 square miles). Of this area 10,000 gross acres (15.6 square miles) lie within the City limits and the remaining 17,000 gross acres (26.5 square miles) within the Planning Area. The community of Bay Point lies in the Sphere of Influence and encompasses 2,300 gross acres. Wetlands and Suisun Bay/Sacramento River environs account for 6,760 additional acres. Bay Point, west of Pittsburg and other unincorporated northwest areas constitute approximately 10,900 acres (33 percent of the Planning Area). Table 2-1 shows the land area distribution within the City and the Planning Area (taken from Table 2.1 2000 General Plan, last amended December 2004).

The City and its residents are increasingly focused on quality-of-life issues. Pittsburg has been designated both a Healthy City by California Healthy Cities and Communities Project, and a Tree City U.S.A. There is an active citywide recycling program, an

Environmental Center with a varied program of environmental classes and an updated General Plan. The City has over 400 acres of parks, a remodeled and expanded 18-hole championship golf course, and a 750-berth marina.

Table 2-1 Existing Land Area Distribution, Pittsburg Planning Area, 1998 (Table 2-1 General Plan)		
Land Use	**Acres**	**Percent of Total**
City of Pittsburg	**7,700**	28%
Residential	2,450	9%
Commercial	400	1%
Industrial	940	3%
Public /Institutional/Utility	650	2%
Parks/Open Space	610	2%
Approved Development	830	3%
Vacant	1,820	7%
Bay Point/ West of Bay Point/ Other NW Unincorporated	10,900	40%
Wetlands/Suisun Bay	6,760	25%
Streets/Roadways	1,600	6%
Total Planning Area	**26,960**	**100%**

City of Pittsburg: City Limits and Planning Area



2.2 Topography & Hydrology

Pittsburg lies near the confluence of the San Joaquin and the Sacramento Rivers on the south shore of Suisun Bay. The northern portion of the City is relatively flat, increasing in elevation as it expands into the southern hills. The hills form the northern tip of the Diablo Range, which extends from Contra Costa County to Santa Clara County. The elevation is 5 feet with a general slope rising at a rate of approximately 2 percent southward to the Contra Costa Canal (about 2 miles). South of the Canal are the foothills of Mt. Diablo, and the slope of the land increases to about 8 percent. Much of the recent development is occurring on the buildable slopes of the foothills to the south. The Pittsburg General Plan contains a detailed description of the topography, geology, and soils of the service area.

The service area lies within the two major drainage basins of Kirker Creek and Willow Creek. These basins discharge into Suisun Bay. The land area within the Kirker Creek drainage basin is primarily urban uses. The Willow Creek drainage area contains some open areas, but it is also increasingly developed into residential and commercial uses. The extreme western portion of the Planning area -- west of Bailey Road -- is within several smaller drainage basins that discharge through improved channels into Honker Bay. A major county landfill immediately adjacent to Bailey Road could potentially impact the drainage basins and groundwater throughout the service area.

2.3 Climate

Pittsburg has a dry Mediterranean climate with hot summers and mild winters. Average summer temperatures range from highs in the upper 90s to lows in the 50s. Winter temperatures range from the 60s to the low 30s.

In the summer a steady marine wind blows through the Golden Gate and up through the Sacramento-San Joaquin Delta. Velocities of 15 to 30 miles an hour or more are common as this cool marine air moves in to replace the rising warmer inland air.

Average precipitation is 13 inches a year, occurring November through April. The hot, dry season of May through October creates a high demand for landscape water.

Table 2-2 Climate	Jan	Feb	Mar	Apr	May	June
Average Rainfall (inches)	2.80	2.43	1.93	0.88	0.38	0.10
Average Temperature (^{o}F)	45.3	50.6	54.4	58.8	64.9	71.0
Standard Monthly Average Evapotransporation (ETo)	0.95	1.75	3.48	5.37	6.88	7.79

	July	Aug	Sep	Oct	Nov	Dec	Annual
Average Rainfall (inches)	0.02	0.05	0.21	0.70	1.66	2.12	13.28
Average Max. Temperature (°F)	74.1	73.3	70.7	63.8	53.5	46.0	60.5
Standard Monthly Average Evapotransporation (ETo)	8.29	7.24	5.33	3.63	1.76	1.01	53.48

(1) Sources of climate date include: the Antioch Pumping Plant #3 weather station (#040232), and average evapotransporation (ETo) data for 1985-2005, for the Brentwood, California station (#47) of the California Management Information System.

2.4 Population Trends

Although the city of Pittsburg has shown steady population growth over the last 20 years, its future growth will be limited as the availability of open, developable land declines. In 1979 the City had 29,100 residents; by 1986 the population had increased to 41,600; and the current 2005 estimate for the City's population is 62,600. The City's General Plan projects 80,700 persons in Pittsburg in the year 2020, with an annual growth rate of 1.7%. That percentage is used to calculate estimated annual population through 2030.

Table 2-3 shows the City's estimated population for 2005, with projections to 2030.

Table 2-3 Population Projections

Year	2005	2010	2015	2020	2025	2030
Service Area Population	62,600	67,800	73,760	80,700	87,800	95,500

2.5 Water Supply Facilities

The city of Pittsburg provides an average of 11.3 million gallons per day of potable water to an estimated 62,600 residents through 15,800 service accounts. Of this total, approximately 800 service accounts are for commercial, industrial, and institutional water users.

The City pumps the untreated water it receives from the Contra Costa Water District (CCWD) to its Water Treatment Plant (WTP) from a connection adjacent to the WTP on CCWD's Contra Costa Canal. The City also has the ability to supplement this supply with ground water pumping; however the ground water supply is limited by the quality and quantity of the water derived from wells. The City blends and treats both sources of water at the WTP.

The WTP has a nominal treatment capacity of 32 million gallons per day (mgd). The principal treated water storage facilities for the Water System include two reservoirs at the WTP and six additional reservoirs throughout the City. They vary in size from 1 million to 5 million gallons, with an additional cumulative storage capacity of 16.9 million gallons. The reservoirs are sized for 50% peak day emergency storage plus operational storage and fire flow. In addition, the City has emergency power for all its major treatment and pumping facilities. Peak day usage in 2005 was 17 million gallons.

Section 3

Water Demand

Law

19631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(2) Agricultural.

(3) The water use projections shall be in the same 5-year increments described in subdivision (a).

3.1 Past Drought, Water Demand, and Conservation

The city's experience with water demand after the 1976-77 drought showed that water demand gradually increases after a drought to pre-drought usage levels. In 1988, a decade after the previous drought, demand peaked at 208.1 gallons per capita per day (gpcpd) and then began to decline as residents began conserving water in response to new dry year conditions.

Water use figures indicate that the year 2000 daily per capita use was 158 gpcpd. The 158 gpcpd figure is derived by dividing total annual water usage by the number of residents. Usage without additional water conservation measures is expected to average 180 gpcpd, which was the usage characteristic adopted in the 2000 City of Pittsburg Water System Master Plan. Water conservation is a continuing priority for the City, and programs such as residential water audits, ultra-low flush toilet replacements, and landscape water audits are accepted mechanisms to address Pittsburg's water conservation responsibilities.

3.2 Past, Current and Projected Water Use

Table 3-1 illustrates past, current, and projected water use for 1980 - 2030 in million gallons (MG) and acre-feet per year (AFY).

Year	*Population*	*MG (Annual)**	*AFY*	*gpcpd*
1980	33,500	2,057	6,313	168
1985	39,800	2,413	7,405	166
1990	46,500	3,120	9,575	184
1995	51,500	3,185	9,774	169
2000	59,500	3,430	10,526	158
2005	62,605	4,113	12,622	180
2010	67,800	4,454	13,669	180
2015	73,800	4,848	14,878	180
2020	80,700	5,302	16,271	180
2025	87,800	5,768	17,701	180
2030	95,500	6,276	19,260	180

* FY 2010 to 2030 at 180 gallons per capita per day (annual average)

3.3 Water Use and Number of Customers - Past, Current and Projected

Tables 3-2 and 3-3 illustrate past, current, and projected water use and numbers of customers. The data for 2001-2003 is from the City's adopted 2004 Water Rate Study. The data is limited by the ability of the billing system software, scheduled for replacement in 2006.

This 1.7% annual demand increase estimate is an annualized projection based on planned improvements and population increases, as defined in the City's General Plan. The growth in demand during any individual year may exceed or fall below this estimate.

Residential Sector

In the city of Pittsburg, single-family residential customers average 3.1 persons per dwelling unit. Multi-family residential customers average 2.7 persons per dwelling unit, and average 10 dwelling units per multi-family complex. Total system per capita water use (combining all water uses) averaged 158 gallons per capita day in calendar year 2000. Water efficiency improvements appear to be reducing per capita water use, which should prevent a return to the 200 gpcpd usage of 1987-89.

By the time that the City is "built-out" it is expected that there will be an increase of 2,000 dwelling units as "in-fill" development in the City and about 7,000 dwelling units added in the southern portion of the City, mostly in the Southwest Hills.

Commercial Sector

The City has a complex mix of commercial customers, ranging from markets, restaurants, professional offices, beauty shops, gas stations, and regional shopping centers. This sector is growing at about 1.7% per year, driven particularly by the need for services for the increasing residential population. This trend is expected to continue through 2030.

Table 3-2 Past, Current and Projected Water Use by Customer Type
Based on 2001-03 data from Pittsburg Finance Department

Water Use Sectors	2001-03 Average	2005	2010	2015	2020	2025	2030
Single family residential	5,316	6,325	6,849	7,452	8,153	8,870	9,651
Multi-family residential	1,073	1,276	1,382	1,504	1,645	1,790	1,947
Commercial	702	835	904	984	1,076	1,171	1,274
Industrial	315	374	405	441	483	525	571
Irrigation	89	106	114	124	136	148	161
Institutional	216	257	278	303	331	361	392
City account- irrigation	570	678	734	799	874	951	1,035
City accounts – Golf Course	414	493	533	580	635	691	752
City accounts- Parks & Facilities	55	65	71	77	84	92	100
Sales to other agencies	0	0	0	0	0	0	0
Saline barriers	0	0	0	0	0	0	0
Groundwater recharge (recycled water)	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Agriculture [1]	0	0	0	0	0	0	0
Other/unaccounted-for system losses [2]	1,860	2,213	2,397	2,608	2,853	3,104	3,377
Total	**10,608**	**12,623**	**13,669**	**14,872**	**16,271**	**17,701**	**19,260**

Unit of Measure: Acre-feet/Year

[1] Agricultural water does not include water that is privately pumped.
[2] Other use includes; (1) leaks, (2) water hydrant flushing use, (3) hydrant meter use for construction, (4) meter under-registration, (5) accounts bills through Journal entries, etc.

Industrial Sector

The City has a significant industrial sector, which includes the USS Posco Steel facility along with large chemical companies, and power generation facilities. While there has been significant growth in this sector with the construction of the new power facilities, the impact on the City's water service has been mitigated by recycled water agreements involving Delta Diablo Sanitation District and Contra Costa Water District to make recycled water available for use at these facilities.

Institutional/Governmental Sector

The City's institutional/governmental water use sector is made up of local government (City and County), public and private schools, and a local community college. The growth of this sector is anticipated to keep pace with the population growth of the city.

Landscape/Recreational Sector

Landscape and Recreational customer demand is expected to increase approximately 1.7% per year for the next 25 years, due to continued growth in park facilities and landscape medians. Increased efficiency and the increased use of recycled water should help offset some of the new demand in this sector. If the Golf Course recycled water project is built, it would significantly mitigate any growth in this sector.

Table 3-3 Number of Connections by Customer Type
Based on 2004 data from Pittsburg Finance Department and projected growth.

Water Use Sectors	2004	2005	2010	2015	2020	2025	2030
Single family residential	14,300	14,543	15,718	16,988	18,361	19,844	21,448
Multi-family residential	347	353	381	412	446	482	520
Commercial	531	540	584	631	682	737	796
Industrial	13	13	14	15	17	18	19
Irrigation	13	13	14	15	17	18	19
Institutional	64	65	70	76	82	89	96
City account- irrigation	150	153	165	178	193	208	225
City accounts – Golf Course	1	1	1	1	1	1	1
City accounts- Parks & Facilities	1	1	1	1	1	1	1
Sales to other agencies	0	0	0	0	0	0	0
Saline barriers	0	0	0	0	0	0	0
Groundwater recharge (recycled water)	0	0	0	0	0	0	0
Conjunctive use	0	0	0	0	0	0	0
Agriculture	0	0	0	0	0	0	0
Fire Service lines	150	153	165	178	193	208	225
Total	**15,570**	**15,835**	**17,114**	**18,497**	**19,992**	**21,607**	**23,353**

Agricultural Sector

There are no designated agricultural water users in the City at this time and no plans for establishing agricultural land uses in the future.

Section 4

Water Supply Sources

Law

10631. A Plan shall be adopted in accordance with this chapter and shall do all of the following:

10631(b.) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.]

10635(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry years...

4.0 Sources

The city of Pittsburg draws its principal raw water supplies from Contra Costa Water District (CCWD). Since 1994 the City has supplemented this supply of surface water from CCWD with ground water supplies drawn from two municipal wells. Table 4-1 outlines Pittsburg's past, current and projected water supplies.

Table 4-1 Past, Current and Projected Water Supplies (AFY)

Water Supply Sources	2000	2005	2010	2015	2020	2025	2030
Purchased from wholesaler (Contra Costa Water District)	9,190	11,552	12,599	13,802	15,201	16,631	18,190
City produced groundwater	1,336	1,000	1,000	1,000	1,000	1,000	1,000
Transfers In or Out	0	0	0	0	0	0	0
Exchanges In or Out							
Recycled Water *	0	70	70	70	70	70	70
Recycled Water used for ground water recharge.	0	0	0	0	0	0	0
Desalination	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	10,526	12,622	13,669	14,872	16,271	17,701	19,260

Units of Measure: Acre-feet/Year
Data used for these projections: City of Pittsburg Water System Master Plan (December 2001), East County Water Supply Management Study (November 1996), recycled water use information from Delta Diablo Sanitation District, and Pittsburg Finance Department.
* not included in total

4.1.1 Contra Costa Water District

The City is within the CCWD service area and purchases Central Valley Project (CVP) from CCWD, its wholesale supplier. CCWD has a contract with the U.S. Bureau of Reclamation (USBR) for 195,000 acre-feet/year of CVP water. In March 2005, CCWD renewed their water

service contract with the USBR for a period of 40 years, through February 2045. The City's resource mix for meeting direct consumption includes local groundwater, recycled water, and imported surface water from CCWD.

The City obtains 85% to 95% of its water supply from CCWD pursuant to a contractual arrangement allowing the City to obtain such quantity of water as is necessary to meet its needs, subject to rationing restrictions in the event of drought or other extraordinary circumstances. The City obtains 5% to 15% from the groundwater wells located in the city of Pittsburg. CCWD's future supply projections assumes adequate availability of surface water sources delivered through their contract with the USBR long with other available sources and short term purchases.

The supply and demand forecast presented in the Plan indicates that the City does not anticipate supply deficits in normal years due to stability of the raw water supply. CCWD has indicated that current demands can be met under all supply conditions. However, starting in 2010, during the second and third year of a multi-year drought, short-term water purchases would most likely need to be reduced by 5% to 15% (see Table 5-3). CCWD has further indicated that it believes the maximum amount of short-term conservation expected to be necessary under drought conditions would be 15% of demand.

In CCWD's 2005 Urban Water Management Plan (December 2005), CCWD presents its supply availability at the district level. This approach does not enable the City to quantify the availability of imported supply from CCWD specific to the City. However, in CCWD's Plan (Section II.2 – *Evaluating Supply Reliability),* CCWD was able to demonstrate it can maintain 100% reliability in meeting direct consumptive demand under a normal hydrologic year, the single-driest hydrologic year, and the first year of a series of multiple dry years through 2030, for its entire service area, including Pittsburg.

Water transfers and exchange and ocean water desalination are two potential sources of supply that are discussed as part of CCWD's long-term resource evaluation, but they are not included in the City's resource mix.

Finally, CCWD's Plan compares the region's supply and demand to determine water service reliability under different climatic conditions-types of water years. The Plan first establishes the hydrologic conditions that define the types of water years in the City by considering a combination for the following three variables:

1. Total retail demand of the water year;
2. Local supply condition of the water year; and
3. Imported supply condition of the water year.

Demand for imported supply typically increases during dry years when the weather is hot and there is a decrease in local runoff. In its 2005 Plan, CCWD demonstrated it has developed flexible water supplies through transfers and storage programs designed to increase its resources during dry water year conditions. As a result, the water year is defined by the net difference of total retail demand less local supplies. Using this approach, CCWD's Plan defines the types of water years in the region as:

- Normal Water Year: average of 83 years, representing the historical hydrology from 1922 to 2004;
- Single Dry Water Year: 1961 hydrology (yields the highest one year demand for imported supply);

- Multiple Dry Water Years: 1959 to 1961 (a sequence that yields the highest three year demand for imported supply);

When comparing supply and demand under those defined water years, CCWD's Plan concludes that the region is projected to maintain 100% water-service reliability under each type of water year. Under single dry water years, retail demand is expected to increase by 6%.

The raw water is supplied via the Contra Costa Canal that conveys water from Rock Slough in the Sacramento-San Joaquin Delta. Pittsburg is primarily dependent upon CCWD for its raw water.

The primary conveyance facility for CCWD's raw water supply is the Contra Costa Canal, which is owned by the USBR and is operated by CCWD. It carries water from Rock Slough on the San Joaquin River Delta or Los Vaqueros Reservoir to delivery locations within the CCWD service area.

Los Vaqueros Reservoir (Los Vaqueros) is a large 100,000 acre-foot storage facility located 8 miles south of Brentwood. Water to fill the reservoir comes from a pump station on Old River near Highway 4. CCWD owns and operates Los Vaqueros and its related intake, pumping, conveyance and blending facilities. Los Vaqueros provides storage to maintain water quality, emergency supply benefits, and some drought protection.

4.1.2 Surface Water Source Quality

All of CCWD's intakes are subject to variations in water quality caused by salinity intrusion, Delta hydrodynamics, and discharges into the Delta and its tributary streams from both point and non-point sources. Since 1992, CCWD has spent over $850 million on capital improvements, including $450 million on the Los Vaqueros Project.

CCWD is implementing a comprehensive water quality strategy to protect and improve source water quality for its customers. CCWD's multi-pronged approach includes seeking improved water quality sources, reducing impacts of Delta agricultural drainage on source water quality, participating in collaborative research on advanced water treatment of Delta water, and supporting regulatory and legislative initiatives for improving drinking water quality and source water protection.

4.2.1 Groundwater and Water Quality

Groundwater Issues

The City of Pittsburg Water System participated in the 1995-96 Seismic and Reliability Improvements Project to evaluate emergency measures for a disruption in water supply. Under those circumstances, the availability of uncontaminated groundwater would be crucial to the City's ability to respond to an extended reduction in surface water supplies.

An environmental issue of concern to Pittsburg residents is Contra Costa County's decision to locate a landfill on the western border of the City. The landfill presents a potential threat to local air quality, impacts property values, and has added to an already congested traffic flow on the southwestern edge of the city. Because the landfill is located above an aquifer, it poses a potential threat to Pittsburg's supplemental and emergency drinking water supplies.

Based on the assurances provided by the landfill's designers and those agencies which permitted the facility to be constructed (Contra Costa County and the State of California), that the facility would not pose significant environmental consequences, the City drilled wells into the aquifer in two locations in the expectation that the groundwater will continue to be of acceptable quality for use as a supplement to the surface water purchased from CCWD.

Groundwater Use

The City has two municipal wells, which are currently producing about 1,000 acre-feet of groundwater per year. These relatively shallow wells (approximately 200 feet deep) deliver approximately 700 gallons per minute each. Both wells were out of service in FY 2004-05 for maintenance reasons. Rossmoor Well was out of service from October 2004 to March 2005. It has since been rehabilitated, and had a new pump/motor installed. Ball Park Well was out of service from September 2004 to July 2005. Ball Park Well is typically out of use in the winter months because the water quality is so poor that the high mineral level cannot be blended down to an acceptable level during low water use months. Ball Park Well also required that a new pump/motor be installed before it could be put back into service which cumulatively resulted in a 9-month shutdown.

The City conducts regular tests of the water pumped from these two wells in compliance with State of California water quality standards (Administrative Code, Title 22) to make sure that the utilization of this water source is consistent with applicable State water standards.

Table 4-2 Annual Well Production (Acre Feet)

Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Rossmoor	na	na	na	1,159	755	791	893	238	781	687	805
Ballpark	na	na	na	705	693	444	443	2	234	3	49
Total	**2,103**	**1,816**	**1,615**	**1,864**	**1,448**	**1,235**	**1,336**	**240**	**1,015**	**690**	**854**

na – individual production amounts are no longer available.

Groundwater Quality

Water from the City's two wells are high in manganese, iron and dissolved solids. Rossmoor Well has a total dissolved solids (TDS) concentration of 600 mg/L and Ball Park Well has a TDS of 1,500 mg/L, among other water quality concerns. A maximum concentration of 500 mg/L is recommended for secondary water quality standards (water aesthetics). The water produced from these wells undergoes blending and complete conventional treatment at the City's Water Treatment Plant.

4.2.2 Groundwater Study and Development of New Sources

On April 4, 2005 the City Council approved an expenditure of $420,000 in the FY 2004/2005 Public Works Department's Capital Improvement Program (CIP) for engineering consulting services for a groundwater study, well site selection and design, and construction of a new municipal water production well.

This project will include preliminary project design for two well sites. The consultant will gather lithologic, well construction, water quality, water level, and other hydrogeologic data for areas in and around the City. The consultant will review available records from Department of Water Resources, Department of Health Services, United States Geologic Survey, Department of Oil and Gas, and private work. This data will be used to develop a conceptualization of the hydrogeology within the City. Water quality and quantity are known to be variable within the City, and the City has experienced problems with dry holes. As such, the initial investigation must be as comprehensive as possible to avoid undertaking additional work in an area with unfavorable hydrogeology (poorer water quantity and/or quality). The consultant will also make a detailed review of data for the City's two existing wells. The history and condition of the wells will be evaluated to determine wherther these wells could feasibly be used on an ongoing basis. Additionally, the consultant will analyze the problems the existing two wells have encountered, and how such problems can be avoided in any new wells.

The new wells will supplement the existing wells sites already in use by the City and allow the City to more fully identify and use the existing groundwater supply. Because of reliability and maintenance problems associated with both wells' design and age, and poor water quality, staff is recommending construction of at least one new well to maintain or increase the groundwater production volume, and site selection for a second well. Proposed sites will be targeted to balance water quality and quantity and use of the existing infrastructure and well transmission lines. There has been no change in the groundwater level in this area as a result of the City's use of the groundwater table, however groundwater level trends over a period of time should be collected and evaluated. The groundwater basin is not adjudicated and there is no groundwater management plan at this time.

Additional funding required to drill and equip one well, and construct related facilities, is estimated at $600,000 to $800,000. This construction phase will be recommended as part of a subsequent Water CIP project.

4.2.3 Groundwater Basin and Potential Well Site Report

The City's geotechnical consultant (Consultant) has conducted a review of geologic literature, maps, and available well records in the region surrounding the city of Pittsburg. Assessments of potential target aquifers have been made based on the available saturated thickness, lithologic character, depositional environment, and available water quality data. The Consultant currently views the most promising target aquifers to be the alluvium of Pleistocene and younger age, and the Pliocene Tehama Formation. The alluvial deposits are currently in use for water production at the City's Ball Park and Rossmoor Wells. Production and water quality from the alluvial deposits is adequate, although better water quality is desired by the City.

The Tehama Formation is reported to have good production capacity and generally better water quality than the alluvial deposits in this geologic setting. Exposures of the Tehama can be seen in the southern hills of Pittsburg, and is exposed at the ground surface at the water treatment plant. Unfortunately, the data from the test hole into the Tehama Formation at the Water

Treatment Plant did not look favorable for a high capacity well at that location.

In a 2003 proposal by another consultant, it was suggested that the Neroly Formation be targeted for water development at depth. The conclusions of the proposal are based upon water quality and aquifer characteristics from a shallow (300 foot) well at the Keller Canyon Landfill in conjunction with projected geologic structure. They proposed the construction of two wells with depths of 1,450 and 1,800 feet, and suggest that the deposits at those depths will have similar water quality and production capacity as the 300 foot well at the landfill.

The San Francisco Bay Region, California Regional Water Quality Control Board's (RWQCB) Order 01-040 regarding the Keller Canyon landfill notes that Keller Canyon is a closed hydrologic basin, meaning that all precipitation must infiltrate into the ground, and since most of the units underlying the landfill are part of the impermeable Kreyenhagen Formation, most of the precipitation would infiltrate into the Neroly Formation. It is well known that freshwater infiltration from precipitation can flush and cause migration and dilution of water in the shallow parts of aquifers that are brackish or marine in nature.

The Neroly Formation is described differently in different areas that it occurs. The Consultant understands that the Neroly is used for water production south of Mt. Diablo, however, their review of the literature along with our analysis of well logs and our experience in the area leads them to believe that the Neroly Formation in this area is brackish at depth, and not a viable target aquifer for the City. Also the RWQCB's Order 01-040 notes that the water from the Cierbo/Neroly aquifer can range from 278 to 7,200 mg/L, but generally has a TDS level less than 1,500 mg/L. The Neroly Formation, a member of the San Pablo Group, is described by Sims et al, 1973 as interbedded marine sandstone, siltstone and shale, with a distinctive bluish color. Finally, the RWQCB's Order 01-040 states that ground water from the Keller Canyon Area, because of water-quality, "is not considered suitable for municipal or domestic water supply".

The Consultant's assessment of the Neroly Formation is that the water quality from this aquifer would be considerably worse than the existing groundwater supplies. The Consultant recommends continuing with exploration of the Tehama Formation and alluvial deposits as currently planned.

Section 5

Water Supply Reliability

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

10631(c.) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631(c.) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

10631(c). Provide data for each of the following:
(1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

10631(d.) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:

10632(b.) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

10635(a.) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional or local agency population projections within the service area of the urban water supplier.

5.1 Reliability

The cost of demand management or supply augmentation options to reduce the frequency and severity of shortages are now high enough that water supply planners must look more carefully at the costs of unreliability to make the best possible estimate of the net benefit of taking specific actions, hence the term "reliability planning." Reliability is a measure of a water service system's expected success in managing water shortages.

To plan for long-term water supply reliability, planners examine an increasingly wide array of supply augmentation and demand reduction options to determine the best courses of action for

meeting water service needs. Such options are generally evaluated using the water service reliability planning approach.

In addition to climate, other factors that can cause water supply shortages are earthquakes, chemical spills, and energy outages at treatment and pumping facilities. Water supply planners include the probability of catastrophic outages when using the reliability planning approach.

Reliability planning requires information about: (1) the expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; (3) how available contingency measures can reduce the impact of shortages when they occur.

5.2 Plans to Assure a Reliable Water Supply - Reliability Comparison

In conformance with California Water Code Division 5, Part 2.6, Section 10635, the Contra Costa Water District (CCWD) prepared an assessment of its water supply reliability. This analysis was provided to all wholesale municipal customers of CCWD for use in the preparation of their Urban Water Management Plans.

Existing demand and demand projections for CCWD's service area in five-year increments over the next 25 years are shown in Table 5-1. The projections are consistent with the projections presented in CCWD's 2002 Future Water Supply Study (FWSS).

Table 5-1: CCWD - Past, Current and Projected Water Demands

Water Use Sectors	2000 (actual) (af/yr)	2004 (actual) (af/yr)	2005 (af/yr)	2010 (af/yr)	2015 (af/yr)	2020 (af/yr)	2025 (af/yr)	2030 (af/yr)
Raw Water Service Area								
Municipal[a]	47,057	53,055	52,383	57,708	63,862	70,015	73,912	77,809
Major Industrial/Irrigation/Ag.[b]	34,836	42,537	53,507	72,177	72,177	72,177	72,177	72,177
Unincorporated Areas	233	251	259	284	305	326	349	371
Subtotal	82,126	95,843	106,148	130,169	136,344	142,518	146,438	150,357
Treated Water Service Area	41,098	43,446	46,434	51,769	54,162	56,555	57,795	59,034
Other Uses								
Other Unincorporated Areas	213	248	262	310	354	398	428	457
Conveyance Losses	10,225	12,500	12,500	12,500	12,500	12,500	12,500	12,500
TOTAL SERVICE AREA [c]	133,662	152,037	165,300	194,700	203,400	212,000	217,200	222,300

(a) Actuals include CCWD municipal sales, City of Antioch River diversions, and an estimate of 3,000 af/yr of groundwater use. Projected water demands have not been reduced by expected water conservation savings.
(b) Future projections of major industrial use include a placeholder amount for industrial customers currently using less than capacity.
(c) All projections have been rounded to the nearest hundred acre-foot/year.

Table 5-2 presents the existing sources of supply and their expected availability under various supply conditions in five-year increments over the next 25 years.

Table 5-3 shows the comparison between projected water supply and demand over the next 25 years. The water supply reliability goal approved by CCWD's Board of Directors is to meet at least 85 percent of demand in a second or third dry year and 100 percent of demand in other years. A combination of short-term water purchases and a voluntary short-term conservation program would meet the remaining 15 percent.

Future demands will be met through implementation of the FWSS. The Preferred Alternative identified in the FWSS included renewal of CCWD's water service contract for CVP water, which has been completed; implementation of an expanded conservation program, which is ongoing; and water transfers to bridge the gap between projected demand and supplies. A February 2000 Agreement with the East Contra Costa Irrigation District (ECCID) to transfer surplus irrigation water was the first long-term water transfer agreement for CCWD. Currently, up to 9,700 acre-feet per year (5,700 acre-feet in normal years and 9,700 acre-feet in CVP shortage years) is available under the agreement. In the future, this agreement will provide up to 12,200 acre-feet per year (8,200 acre-feet in normal years and 12,200 acre-feet in CVP shortage years).

In later years, several types of drought conditions may result in supply shortfalls between 16,000 and 50,000 acre-feet. The water supply reliability goal adopted by CCWD's Board of Directors is to meet 100 percent of demand in normal years and a minimum of 85 percent of demand during a drought. Planned implementation of the FWSS preferred alternative would provide a minimum of 22,000 acre-feet of additional supply through water transfer agreements. A combination of short-term water purchases and drought demand management are planned to meet any remaining supply deficit.

Note that current demands can be met under all supply conditions. However, beginning in 2010, during the second and third years of a multi-year drought, short-term water purchases in conjunction with a request for up to a 5 and 15 percent, respectively, voluntary short-term conservation would be considered to meet demands. The maximum amount of short-term conservation expected to be necessary is 15 percent of demand.

Table 5-2: CCWD - Projected Water Supply

Condition [a]	CVP (af/yr)	Industrial Diversions (af/yr)	Mallard Slough [b] (af/yr)	Antioch Diversions[c] (af/yr)	Ground-water [d] (af/yr)	ECCID Purchases (af/yr)	Recycled Water (af/yr)	Total Firm Supply (af/yr)	Conser-vation savings (af/yr)	Total Supply (af/yr)
2005										
Normal	174,100	10,000	3,100	6,700	3,000	5,700	7,500	210,100	1,900	212,000
Single-Year Drought	148,000	0	0	0	3,000	9,700	7,500	168,200	1,900	170,100
Multi-Year Drought (yr 1)	148,000	0	0	0	3,000	9,700	7,500	168,200	1,900	170,100
Multi-Year Drought (yr 2)	130,600	0	0	0	3,000	9,700	7,500	150,800	1,900	152,700
Multi-Year Drought (yr 3)	113,200	0	0	0	3,000	9,700	7,500	133,400	1,900	135,300
2010										
Normal	194,700	10,000	3,100	6,700	3,000	7,000	12,000	236,500	3,800	240,300
Single-Year Drought	165,500	0	0	0	3,000	11,000	12,000	191,500	3,800	195,300
Multi-Year Drought (yr 1)	165,500	0	0	0	3,000	11,000	12,000	191,500	3,800	195,300
Multi-Year Drought (yr 2)	146,000	0	0	0	3,000	11,000	12,000	172,000	3,800	175,800
Multi-Year Drought (yr 3)	126,600	0	0	0	3,000	11,000	12,000	152,600	3,800	156,400
2015										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	6,200	244,200
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	6,200	199,200
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	6,200	199,200
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	6,200	179,700
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	6,200	160,200
2020										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	8,500	246,500
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	8,500	201,500
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	8,500	201,500
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	8,500	182,000
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	8,500	162,500
2025										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	11,100	249,100
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	11,100	204,100
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	11,100	204,100
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	11,100	184,600
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	11,100	165,100
2030										
Normal	195,000	10,000	3,100	6,700	3,000	8,200	12,000	238,000	13,600	251,600
Single-Year Drought	165,800	0	0	0	3,000	12,200	12,000	193,000	13,600	206,600
Multi-Year Drought (yr 1)	165,800	0	0	0	3,000	12,200	12,000	193,000	13,600	206,600
Multi-Year Drought (yr 2)	146,300	0	0	0	3,000	12,200	12,000	173,500	13,600	187,100
Multi-Year Drought (yr 3)	126,800	0	0	0	3,000	12,200	12,000	154,000	13,600	167,600

a) 2005 PLAN: The CVP conditions used for supply Planning are defined as follows: Normal is Adjusted Historical Use. **Single Year Drought and Multi-year drought (year 1) supply is 85 percent of Historical Use.** Multi-Year Drought (year 2) is 75 percent of Historical Use. Multi-Year Drought (year 3) is 65 percent of Historical Use.

b) Average annual diversion over 15 year period (1990 - 2004).

c) Average annual diversion over 6 year period since pumping Plant improvements (1999 - 2004).

d) Groundwater represents production from Mallard Wells, Diablo Water District wells, and miscellaneous other wells in the District's service area.

Table 5-3: CCWD - Projected Supply and Demand Comparison					
Condition [a]	Demand (af/yr)	Available Supply (af/yr)	Supply Deficit (af/yr)	Planned Purchases [b] (af/yr)	Short-term Demand Management [c] (af/yr)
2005					
Normal	165,300	212,000	none	-	-
Single-Year Drought	165,300	170,100	none	-	-
Multi-Year Drought (yr 1)	165,300	170,100	none	-	-
Multi-Year Drought (yr 2)	165,300	152,700	12,600	-	-
Multi-Year Drought (yr 3)	165,300	135,300	30,000	-	-
2010					
Normal	194,700	240,300	none	-	-
Single-Year Drought	194,700	195,300	none	-	-
Multi-Year Drought (yr 1)	194,700	195,300	none	-	-
Multi-Year Drought (yr 2)	194,700	175,800	18,900	9,000	9,900
Multi-Year Drought (yr 3)	194,700	156,400	38,300	9,000	29,300
2015					
Normal	203,400	244,200	none	-	-
Single-Year Drought	203,400	199,200	4,200	5,000	-
Multi-Year Drought (yr 1)	203,400	199,200	4,200	5,000	-
Multi-Year Drought (yr 2)	203,400	179,700	23,700	13,000	10,700
Multi-Year Drought (yr 3)	203,400	160,200	43,200	13,000	30,200
2020					
Normal	212,000	246,500	none	-	-
Single-Year Drought	212,000	201,500	10,500	11,000	-
Multi-Year Drought (yr 1)	212,000	201,500	10,500	11,000	-
Multi-Year Drought (yr 2)	212,000	182,000	30,000	18,000	12,000
Multi-Year Drought (yr 3)	212,000	162,500	49,500	18,000	31,500
2025					
Normal	217,200	249,100	none	-	-
Single-Year Drought	217,200	204,100	13,100	14,000	-
Multi-Year Drought (yr 1)	217,200	204,100	13,100	14,000	-
Multi-Year Drought (yr 2)	217,200	184,600	32,600	19,500	13,100
Multi-Year Drought (yr 3)	217,200	165,100	52,100	19,500	32,600
2030					
Normal	222,300	251,600	none	-	-
Single-Year Drought	222,300	206,600	15,700	16,000	-
Multi-Year Drought (yr 1)	222,300	206,600	15,700	16,000	-
Multi-Year Drought (yr 2)	222,300	187,100	35,200	21,500	13,700
Multi-Year Drought (yr 3)	222,300	167,600	54,700	21,500	33,200

a) **Single Year Drought and Multi-year drought (year 1) supply is 85 percent of Historical Use.** Multi-Year Drought (year 2) is 75 percent of Historical Use. Multi-Year Drought (year 3) is 65 percent of Historical Use.

b) Planned purchases consistent with the District's Future Water Supply Implementation Program. The water supply reliability goal adopted by the Board of Directors is to meet at least 85 percent of demand in a 2nd or 3rd dry year and 100 percent of demand in other years.

c) Beginning in 2010, during the second and third years of a multi-year drought, short-term water purchases in conjunction with a request for up to a 5 and 15 percent, respectively, voluntary short-term conservation would be considered to meet demands.

5.3 Three Year Minimum Water Supply and Supply and Demand Comparison

The City was affected by the drought during 1976-77 and a subsequent water crisis in the early 1990s. The City adopted a water conservation ordinance in 1991. This ordinance, the water conservation strategies implemented by CCWD and the City, and the voluntary conservation efforts of the City's water users resulted in a reduction in per capitia water usage, at that time.

Based on experiences during the drought conditions of 1990-92, the community recognizes that it is better to enter into a water shortage alert early, at a minimal level, to establish necessary rationing programs and policies, to gain public support and participation, and to reduce the likelihood of more severe shortage levels later. As the community continues to become more water efficient, it may become more difficult for customers to reduce their water use during water shortages (this is called "demand hardening"). Staff does not believe that City customers are yet approaching demand hardening, because there are still potential water efficiency improvements in residential plumbing fixtures, appliances, and landscapes, and in the commercial, industrial, and institutional sectors that have yet to be implemented. However, improved water use efficiency does mean that water supply reserves must be larger and that water shortage responses must be made early to prevent severe economic and environmental impacts.

Table 5-4 compares current and projected water supply and demand. Indications are that in average precipitation years, the city of Pittsburg will have sufficient water to meet its customers' needs, through 2030.

In a second consecutive dry year, the City will probably need to enter into a Stage I water shortage response. In the third consecutive dry year, or in the event of a major system failure, the City may continue a Stage I water shortage response or move into a Stage II water shortage response. See Table 5-4 for the proposed shortage amount and the Water Shortage Contingency Plan for more detailed information.

Active water efficiency improvements will be necessary to meet the City's projected water demand. The City will continue to examine supply enhancement options, including additional water recycling, conjunctive use, water transfers, and additional imported water supplies through its participation in the East County Water Management Association and collaboration with its principle raw water supplier the Contra Costa Water District.

5.4 Planned Water Supply Projects

See Groundwater and Recycled Water Sections.

Table 5-4: City of Pittsburg - Projected Supply and Demand Comparison

Condition [a]	Total demand	GW Supply* (af/yr)	Demand – from CCWD (af/yr)	Supply Deficit %	Supply Deficit (af/yr)	Available Supply (af/yr)
2005						
Normal	12,622	1,000	11,622	0	0	12,622
2010						
Normal	13,669	1,000	12,669	0	0	12,669
Single-Year Drought	13,669	1,000	12,669	0	0	12,669
Multi-Year Drought (yr 1)	13,669	1,000	12,669	0	0	12,669
Multi-Year Drought (yr 2)	13,669	1,000	12,669	5.1	646	12,023
Multi-Year Drought (yr 3)	13,669	1,000	12,669	15	1,900	10,769
2015						
Normal	14,872	1,000	13,872	0	0	13,872
Single-Year Drought	14,872	1,000	13,872	0	0	13,872
Multi-Year Drought (yr 1)	14,872	1,000	13,872	0	0	13,872
Multi-Year Drought (yr 2)	14,872	1,000	13,872	5.3	735	13,137
Multi-Year Drought (yr 3)	14,872	1,000	13,872	15	2,081	11,791
2020						
Normal	16,271	1,000	15,271	0	0	15,271
Single-Year Drought	16,271	1,000	15,271	0	0	15,271
Multi-Year Drought (yr 1)	16,271	1,000	15,271	0	0	15,271
Multi-Year Drought (yr 2)	16,271	1,000	15,271	5.7	870	14,401
Multi-Year Drought (yr 3)	16,271	1,000	15,271	15	2,291	12,980
2025						
Normal	17,701	1,000	16,701	0	0	16,701
Single-Year Drought	17,701	1,000	16,701	0	0	16,701
Multi-Year Drought (yr 1)	17,701	1,000	16,701	0	0	16,701
Multi-Year Drought (yr 2)	17,701	1,000	16,701	6	1,002	15,699
Multi-Year Drought (yr 3)	17,701	1,000	16,701	15	2,505	14,196
2030						
Normal	19,260	1,000	18,260	0	0	18,260
Single-Year Drought	19,260	1,000	18,260	0	0	18,260
Multi-Year Drought (yr 1)	19,260	1,000	18,260	0	0	18,260
Multi-Year Drought (yr 2)	19,260	1,000	18,260	6.2	1,132	17,128
Multi-Year Drought (yr 3)	19,260	1,000	18,260	15	2,739	15,521

* Assumes 1,000 af/yr from Groundwater sources.

5.5 Transfer or Exchange Opportunities

A seemingly apparent source of water for Pittsburg would be diversion directly from the Delta via a pump station and pipeline to the Pittsburg Water Treatment Plant. However, this is not a feasible alternative for several reasons:

- Pittsburg has not established water rights to the San Joaquin/Sacramento Rivers. Permits to withdraw water would be required from the State Water Resources Control Board as well as other state and federal agencies. Not only would the approval process be lengthy, but also there is no guarantee that the permit would be approved.

- Water taken from the Delta adjacent to the City is highly saline for at least part of the year, and could require extensive treatment (reverse osmosis). The city of Antioch, upstream of the city of Pittsburg, uses water from the Sacramento River only from December to July or August because of water salinity issues.

- The cost of the pump station and its attached force main was estimated to be 1.6 million dollars in 1985. In 2000, the cost would be approximately 2.7 million dollars (based on estimates cited in the City's 1995 Plan).

Other possible supplemental sources are a tie-in to another major supplier, such as the East Bay Municipal Utility District (EBMUD), or to other local water districts. EBMUD's major transmission line passes through the city of Pittsburg. CCWD is now making provisions for an emergency intertie between the two raw water supplies, and has applied for Proposition 50 funding for this project. Under the existing water regulations, the EBMUD is precluded from providing water directly to Pittsburg.

Neighboring communities that provide water service, such as the city of Antioch, are as dependent upon Contra Costa Water District as the city of Pittsburg. The fact that Antioch can directly draw water from the Delta allows for them to augment this source but under a reduced supply scenario it would be unlikely that Antioch would be able to provide supplemental water to Pittsburg.

5.6 Potential Future Desalination Supply

Desalination involves removing salts and impurities from non-potable water (e,g,, seawater, brackish surface water or brackish groundwater) using treatment technologies such as reverse osmosis membranes or distillation methods. After treatment, the water is suitable for all drinking water purposes.

Potential opportunities for desalination supply in east Contra Costa County are being explored on a regional level through the East County Water Management Association, of which the city of Pittsburg is an active participant. To date, the cost of implementing desalination supply including brine disposal, has not been cost-effective compared with other available sources. As advancements in technology make desalination a more cost-effective option in coming years, the East County water agencies, including the city of Pittsburg, will consider desalination projects as potential supply sources.

Section 6

Water Demand Management Measures

Law

10631(f.) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

The city of Pittsburg is a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California (MOU) and is therefore a member of the California Urban Water Conservation Council (CUWCC)).

As a member of the CUWCC, the City's filing of Best Management Practice Reports (BMP) with the CUWCC meets the Demand Management Measures requirement of the Urban Water Management Planning Act. The BMP reports for 2002-2003 are included with this report (see Appendix B) and have been filed electronically with the CUWCC according to designated procedure. The City has, in good faith, tried to address and comply with all of the BMP targets listed in the CUWCC MOU where applicable.

Section 7

Water Shortage Contingency Plan

Law

10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:

10632(a.) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

10632(d.) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632(e.) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632(f.) Penalties or charges for excessive use, where applicable.

10632(g.) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier...

10632 (h) A draft water shortage contingency resolution or ordinance.

10632(i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis

Stages of Action

7.1 Rationing Stages and Reduction Goals

The City has developed a four stage rationing plan (see Table 7-1) for implementation during declared water shortages. The rationing plan includes voluntary and mandatory rationing, depending on the causes, severity, and anticipated duration of the water supply shortage.

Table 7-1 Water Rationing Stages and Reduction Goals

Shortage Condition	Stage	Customer Reduction Goal	Type of Rationing Program
Up to 10%	I	5-15%	Voluntary
10 – 20%	II	10-25%	Voluntary
25 - 35%	III	15-45%	Mandatory
35 - 50%	IV	35-100%	Mandatory

7.2 Priority by Use

Priorities for use of available potable water during shortages were based on input from the water shortage response team, citizens, and legal requirements set forth in the California Water Code, Sections 350-358. Water allocations are established for all customers according to the following ranking system:

1. Minimum health and safety allocations for interior residential needs (includes single family, multi-family, hospitals and convalescent facilities, retirement and mobile home communities, and student housing, and fire fighting and public safety)
2. Commercial, industrial, institutional/governmental operations (where water is used for manufacturing and for minimum health and safety allocations for employees and visitors), to maintain jobs and economic base of the community (not for landscape uses)
3. Existing landscaping
4. New customers, proposed projects without permits when shortage declared.

7.3 Health and Safety Requirements

Based on commonly accepted estimates of interior residential water use in the United States, Table 7-2 indicates per capita health and safety water requirements. In Stage I and II shortages, customers may adjust either interior or outdoor water use (or both), in order to meet the voluntary water reduction goal.

However, under Stage III and Stage IV mandatory rationing programs, the City has established a health and safety allotment of 68 gpcpd, because that amount of water is sufficient for essential interior water with no habit or plumbing fixture changes. If customers wish to change water use habits or plumbing fixtures, 68 gpcpd is sufficient to provide for limited non-essential (i.e. outdoor) uses.

Stage IV mandatory rationing, which is likely to be declared only as the result of a prolonged water shortage or as a result of a disaster, would require that customers make changes in their interior water use habits (for instance, not flushing toilets unless "necessary" or taking less frequent showers).

Table 7-2
Per Capita Health and Safety Water Quantity Calculations

	Non-Conserving Fixtures		Habit Changes 1		Conserving Fixtures 2	
Toilets	5 flushes x 5.5 gpf	27.5	3 flushes x 5.5 gpf	16.5	5 flushes x 1.6 gpf	8.0
Shower	5 min x 4.0 gpm	20.0	4 min x 3.0 gpm	12.0	5 min x 2.0	10.0
Washer	12.5 gpcd	12.5	11.5 gpcd	11.5	11.5 gpcd	11.5
Kitchen	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Other	4 gpcd	4.0	4 gpcd	4.0	4 gpcd	4.0
Total (gpcd)		68.0		48.0		37.5
HCF per capita per year		33.0		23.0		18.0

1 Reduced shower use results from shorter and reduced flow. Reduced washer use results from fuller loads.
2 Fixtures include ULF 1.6 gpf toilets, 2.0 gpm showerheads and efficient clothes washers.

7.4 Water Shortage Stages and Triggering Mechanisms

As the water purveyor, the city of Pittsburg must provide the minimum health and safety water needs of the community at all times. The water shortage response is designed to provide a minimum of 50% of normal supply during a severe or extended water shortage. The rationing program triggering levels shown below were established to ensure that this goal is met.

Rationing stages may be triggered by a shortage in one water source or a combination of sources. Although an actual shortage may occur at any time during the year, a shortage (if one occurs) can usually be forecast by the City and/or the Contra Costa Water District by April 1st of each year

The City's potable water sources are surface and groundwater. Rationing stages may be triggered by a supply shortage, a natural disaster (canal failure due to earthquake, etc.) or by contamination in one source or a combination of sources. Specific criteria for triggering the City's rationing stages are shown in Table 7-3.

Table 7-3 Water Shortage Stages and Triggering Mechanisms

Percent Reduction of Supply	Stage I Up to 10%	Stage II 10 - 20%	Stage III 20 – 35%	Stage IV 35 - 100
		Water Supply Condition		
Current Supply	Total supply is 85 – 90% of "normal." And Below "normal" year is declared. Or	Total supply is 75 – 85% of "normal." Or Below "normal" year is declared Or	Total supply is 65 – 75% of "normal." Or Fourth consecutive below "normal" year is declared. Or	Total supply is less than 65% of "normal." Or Fifth consecutive below "normal" year is declared. Or
Future Supply	Projected supply insufficient to provide 80% of "normal" deliveries for the next two years. Or	Projected supply insufficient to provide 75% of "normal" deliveries for the next two years. Or	Projected supply insufficient to provide 65% of "normal" deliveries for the next two years. Or	Projected supply insufficient to provide 50% of "normal" deliveries for the next two years. Or
Groundwater	Reduced groundwater pumping. Or	Reduced groundwater pumping. Or	No groundwater pumping available. Or	No groundwater pumping available. Or
Water Quality	Contamination of 10% of water supply (exceeds primary drinking water standards)	Contamination of 20% of water supply (exceeds primary drinking water standards)	Contamination of 30% of water supply (exceeds primary drinking water standards)	Or
Disaster Loss				Disaster Loss

Water Allotment Methods

In 1992, the City adopted the following allocation method for each customer type, as part of the "Water Shortage Contingency Plan".

Single Family	Hybrid of Per-capita and Percentage Reduction
Multifamily	Hybrid of Per-capita and Percentage Reduction
Commercial	Percentage Reduction
Industrial	Percentage Reduction
Gvt/Institutional	Percentage Reduction
Recreational	Percentage Reduction - vary by efficiency

New Customers — Per-capita (no allocation for new landscaping during a declared water shortage.)

Based on current and projected customer demand, the Water Shortage Contingency Plan indicates the water allocated to each customer type by priority and rationing stage during a declared water shortage.

Individual customer allotments will be based on their usage during the preceding year. Notification will be in writing and those wishing to appeal the level of their allocation may do so to the designated Water Control Referee (WCR). The decision of the WCR may be appealed to an appeal board established for the purpose of considering such appeals and this group will either uphold or modify the determination by the WCR.

7.5 Prohibitions, Consumption Reduction Methods and Penalties

Mandatory Prohibitions on Water Wasting

The Pittsburg Water Conservation Ordinance (see Appendix 2) includes prohibitions on various wasteful water uses such as lawn watering during mid-day hours, washing sidewalks and driveways with potable water, and allowing plumbing leaks to go uncorrected.

The City's Water Conservation Ordinance (Ordinance) and Water Shortage Contingency Plan outlines the reduction methods shown in Table 7-4.

Table 7-4 Consumption Reduction Methods

Examples of Consumption Reduction Methods	Stage When Method Takes Effect
Demand reduction program	All stages
Reduce pressure in water lines	
Flow restriction	IV
Restrict building permits	II, III, IV
Restrict for only priority uses	
Use prohibitions	All stages
Water shortage pricing	All stages
Per capita allotment by customer type	IV
Plumbing fixture replacement	
Voluntary rationing	I, II
Mandatory rationing	III, IV
Incentives to reduce water consumption	
Education Program	All Stages
Percentage reduction by customer type	II, III, IV
Other	
Other	

Excessive Use Penalties

Any customer violating the regulations and restrictions on water use, under conditions of mandatory rationing, set forth in the Ordinance shall receive a written warning for the first such violation. A second violation, and each one thereafter of the provisions of the Ordinance shall

constitute a misdemeanor and may be referred to the Contra Costa County District Attorney's office for prosecution pursuant.

7.6 Revenue Impacts of Reduced Sales During Shortages

As part of the Water Shortage Contingency Plan adopted by the City in 1992, there are procedures outlined for the raising of water rates, depending on the City's available reserve fund, as a disincentive against the overuse of water when the water shortage represents a Stage II event. Additional consideration concerning the establishment of water rates to address the revenue shortfall of diminished use will be addressed by the City Council as necessary to meet any continuing water shortage emergency.

7.7 Preparation for Catastrophic Water Supply Interruption - Water Shortage Emergency Response

In 1992, in accordance with the requirements of Assembly Bill 11, the City developed and adopted (Resolution No. 92-7772) a comprehensive Water Shortage Contingency Plan (Appendix C). This plan contains procedures for the distribution of potable water during a supply emergency.

The contingency Plan follows the guidelines of the California Department of Water Resources Urban Drought Guidebook. Central components of the Plan are the designation of priority water uses to maintain public safety and health and the designation of specific responses to be implemented to meet supply emergencies.

In the event of a supply emergency, the City recognizes the importance of Demand Management Measures in reducing water demand and would continue to implement these programs. The City would, in collaboration with the Contra Costa Water District, increase media attention to the water supply situation during a shortage and would step up public water education programs, encourage property owners to apply for a landscape and interior water use survey and continue to advertise the importance of customers to install ULF plumbing fixtures.

During water shortages, CCWD manages its water supply to ensure it meets the demands of its member agencies. Water shortages may result form variations in weather, natural disasters, or unanticipated situations (i.e. systems failures, acts of terror). During a severe water shortage, CCWD would be responsible for allocating its imported water supply. Water supply to the city of Pittsburg would be supplemented by the City's groundwater sources.

If an earthquake, or other form of disaster, damaged the Contra Costa Canal or disrupted the delivery of raw water, Pittsburg would utilize; (1) the local groundwater aquifer as a raw water supply, and (2) emergency interties to the City of Antioch and the proposed interties to CCWD's Multipurpose Pipeline, when completed, as treated water supplies within the limitations of these sources.

During declared shortages, or when a shortage declaration appears imminent, the Public Works Director, who serves as chair, activates a City Water Shortage Response Team. The team includes: water, engineering, finance, emergency services, public affairs, and parks and recreation representatives. This team will coordinate its activities with the City Manager's Office, the Contra Costa Consolidated Fire Department, and the Contra Costa Water District.

The following table summarizes the actions the City will take during a water supply emergency (as outlined in the City's Water Shortage Contingency Plan).

Table 7-5 Preparation Actions for a Catastrophe

Examples of Actions	Check if Discussed
Determine what constitutes a proclamation of a water shortage.	✓
Stretch existing water storage.	✓
Obtain additional water supplies.	✓
Develop alternative water supplies.	✓
Determine where the funding will come from.	✓
Contact and coordinate with other agencies.	✓
Create an Emergency Response Team/Coordinator.	✓
Create a catastrophe preparedness Plan.	✓
Put employees/contractors on-call.	✓
Develop methods to communicate with the public.	✓
Develop methods to prepare for water quality interruptions.	✓

7.8 Water Shortage Contingency Resolution and Use Monitoring Procedure

City of Pittsburg Water Shortage Response

As mentioned earlier, the City adopted Resolution No. 92-7772 a comprehensive Water Shortage Contingency Plan in 1992.

Mechanism to Determine Reductions in Water Use

Under normal water supply conditions, potable water production figures are recorded daily at the Water Treatment Plant. Totals are reported monthly to the Finance Department and the Public Works Director and incorporated into a water supply report.

During a Stage I or Stage II water shortage, daily production figures are reported to the Water Treatment Plant Superintendent. He/she would compare the weekly production to the target weekly production to verify that the reduction goal is being met. Weekly reports would be forwarded to the Water Shortage Response Team (currently consisting of Public Works Director, Chair and representatives from the Water Treatment Plant, Water Line maintenance, Golf Course, and Community Development and Finance Departments). Monthly reports are sent to the City Manager. If reduction goals are not met, the City Manager would be notified so that additional actions may be considered by the City Council to address the water shortage.

During a Stage III or Stage IV water shortage, the procedure listed above would be followed, with the addition of a daily production report to the City Manager.

During emergency shortages, production figures are reported to the Chair hourly and to the Water Shortage Response Team daily. Daily reports would also be provided to the City Manager.

Section 8
Water Recycling

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the Plan shall be coordinated with local water, wastewater, groundwater, and Planning agencies and shall include all of the following:

10633(a.) A description of the wastewater collection and treatment systems in the supplier's service area...

10633(b.) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633(c.) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633(d.) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

10633(f.) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recycling uses.

8.1 Wastewater System Description

Wastewater Collection and Treatment in Pittsburg

The Delta Diablo Sanitation District Wastewater Treatment Plant (WWTP) services the cities of Antioch and Pittsburg and the unincorporated county area of Bay Point. All of the wastewater that flows in the City's sanitary sewer system is collected and treated at the WWTP. The WWTP is designed with a Delta outfall for wastewater disposal. The WWTP has both Secondary level and, in January of 2001, partial Tertiary treatment capability.

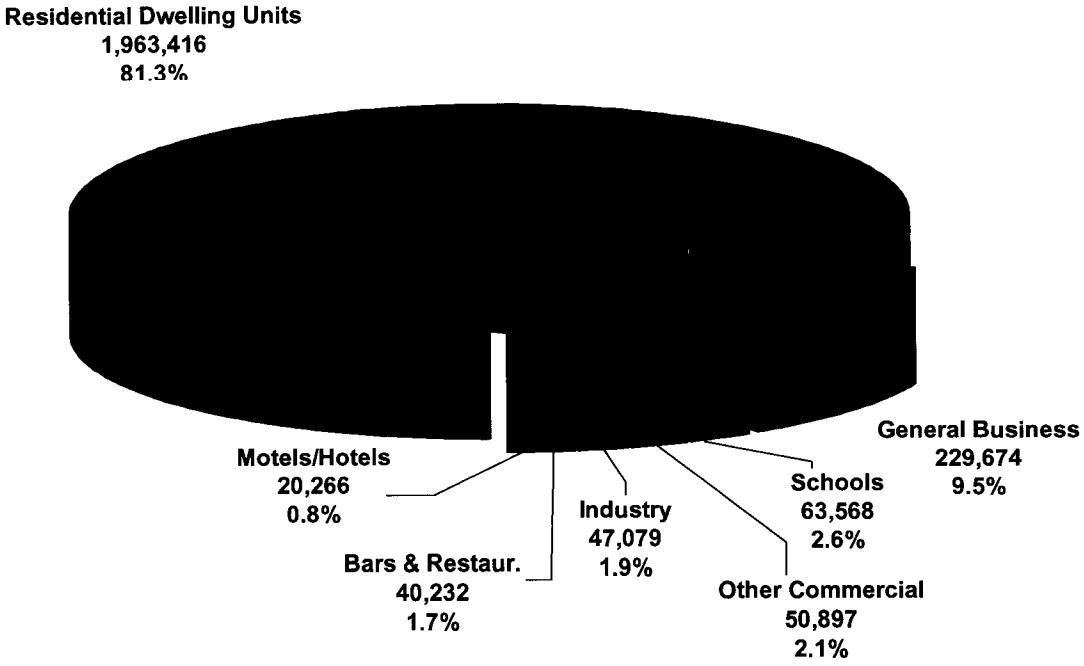
Table 8-1
Wastewater Treatment – Delta Diablo Sanitation District Regional Treatment Facility
Based on actual and projected data from DDSD

Treatment Plant Name	Location (City)	Average Daily (2000)	Maximum Daily (2000)	Year of Planned Build-out	Planned Maximum Daily Volume
Delta Diablo	Pittsburg	13.6MGD	17.4MGD	2040	22.3MGD

Wastewater usage is estimated based on water usage as developed for the City of Pittsburg's

"Development of Sewer Charges" report dated April 2005 (Figure ES.2).

Table 8.2 Sewer Collection System Flow by Customer Class, FY 05/06



Total Sewer Flow = 2,415,132 Ccf

Wastewater Treatment Processes

Current wastewater treatment at the WWTP includes the following processes:

1) Primary Treatment
2) Primary Sedimentation
3) Activated Sludge/Trickling Filter
4) Chlorination/Dechlorination
5) Wastewater Disposal

8.2 Recycled Water

The authority for the Recycled Water Program of the Contra Costa Water District was established by the adoption of the CCWD Strategic Plan by the Board of Directors in February of 1989. In addressing issues regarding development of new markets for recycled water, the CCWD Board adopted a policy statement to develop a market for recycled water in Central and East County. Subsequently, the Board adopted Resolution No. 90-79 declaring certain policies in regard to recycled water that included: "CCWD will implement recycled water projects which are financially viable, provide beneficial use and are consistent with appropriate legal, public health and environmental requirements."

CCWD has executed recycled water agreements with both the Central Contra Costa Sanitary District and the Delta Diablo Sanitation District (DDSD) which allows for the development of joint

projects, individual projects involving cooperative planning, and expand the opportunities for recycled water use in the service area of CCWD and the associated sanitation districts.

The cooperative efforts of the CCWD and DDSD to develop projects that currently supply industrial customers with recycled water represents a significant step in encouraging future recycled water projects.

8.3 **Recycled Water Use**

In 2000, DDSD and CCWD reached an agreement for DDSD to provide recycled wastewater to the Delta Energy Center and the Los Medanos Energy Center. Treated wastewater from DDSD is being used for turbine cooling at the energy facilities. Additional treatment of the water to comply with requirements of the Department of Health Services is performed onsite with a new 12.8 mgd reclamation plant.

Currently, the region collects about 15,200 acre-feet of wastewater per year (average 13.6 mgd). Approximately 45% of wastewater is used for recycled supply. The remainder is disposed through a river outfall. It is expected that the amount of recycled water will increase in the future. In 2004, the Los Medanos Energy Center used 3,250 acre feet and the Delta Energy Center used 3,764 acre feet of recycled water.

Given the large amount of recycled water that was supplied to these industrial facilities and given the fact that the City will not be required, even in a back-up role, to supply water for these facilities we have chosen not to include these projected uses in the estimated demand calculations. The back up water supply for these industrial customers is CCWD.

The City supports the further development of irrigation and industrial recycled water uses where available supplies of recycled water and appropriateness of planned use coincide. The City has utilized recycled water for irrigation purposes (parks and road median landscaping) in the drought of the early 1990s. DDSD began providing recycled wastewater to city of Pittsburg irrigation locations at Central Park and along the 8th Street, Columbia and Santa Fe Corridors in 2001. The total demand for this use in 2004 was 67 acre-feet.

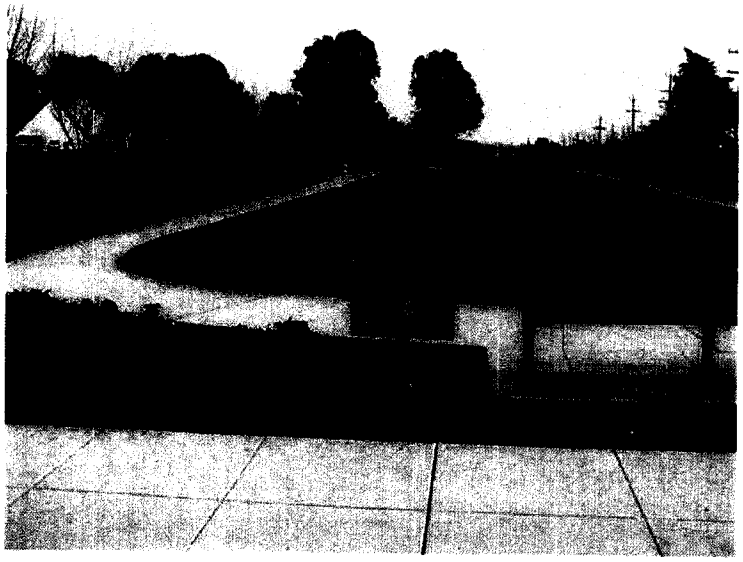


Table 8-3 Recycled Water Use

PITTSBURG PARKS (GPD)		2001	2002	2003	2004
Central Park	Pittsburg #1 meter	2,247	6,373	15,808	14,027
Columbia Linear Park (East)	Pittsburg #2 meter	11,684	25,051	20,700	22,833
Santa Fe Linear Park (West)	Pittsburg #3 meter	106,192	52,785	7,450	3,475
8th and Harbor	Pittsburg #4 meter	8,510	4,610	8,755	2,133
8th and West	Pittsburg #5 meter	580	3,192	2,970	2
8th and Herb White	Pittsburg #6 meter	0	3,533	9,023	14,700
Pittsburg P/S	Pittsburg #7 meter	0	2,747	3,062	1,675

	2001	2002	2003	2004
TOTAL City of Pittsburg (MGD)	0.13	0.10	0.07	0.06
TOTAL City of Pittsburg (AFD)	0.40	0.31	0.21	0.18
TOTAL City of Pittsburg (AFY)	145.6	112.0	78.4	67.2

POWER PLANTS (MGD)	2001	2002 (Jul-Dec)	2003	2004	Annual (AFY)- 2004
LMEC		3.25	2.83	2.69	3,013
DEC		4.9	3.75	3.36	3,764

	2001	2002	2003	2004
TOTAL DDSD RWF FLOW (MGD)	2.56	6.3	6.7	6.1
TOTAL DDSD RWF FLOW (AFY)	2,867.6	7,056.9	7,505.0	6,832.9

GPD: Annual average gallons per day

MGD: Annual average million gallons per day

AFD: Acre Feet per day

AFY: Acre Feet per year

Potential Uses of Recycled Water

Potential recycled water opportunities have been identified in the Future Water Supply Study for CCWD and other recycled water studies prepared by DDSD. They include urban landscape irrigation projects, industrial reuse projects, agricultural irrigation projects, and groundwater recharge recycling projects. Most projects would require construction of additional water treatment and distribution facilities. Following are brief discussion of the potential alternatives.

Urban Landscape Irrigation Projects – These projects could supply recycled water for landscape irrigation. Potential irrigation sites include new and existing parks, schools, golf courses, natural and man-made wetlands, median strips, business parks, and homeowner associations. Potential projects could be located in Central Contra Costa County, Pittsburg/Antioch area, and in far east Contra Costa County.

Industrial Reuse Projects – These projects could supply highly treated recycled wastewater to selected industrial customers for process and cooling purposes. Industries typically demand very high quality water, requiring tertiary and sometimes demineralized treatment. Potential customers in Central and Eastern Contra Costa County include several oil refineries, USS-Posco, and Dow Chemical.

Groundwater Recharge Projects – This type of recycled water project involves injecting highly treated wastewater into a groundwater aquifer. A groundwater recharge recycled project could be used for indirect potable reuse in critical periods. A high level of recycled water treatment would be provided and the recycled water could be injected into a groundwater aquifer and withdrawn for potable use during critical flow periods.

Encouraging Recycled Water Use - Recycled Water Project

DDSD and the City are currently pursuing a mutually beneficial project aimed at expanding recycled water use within the Pittsburg/Bay Point Area. DDSD provides treatment and disposal of wastewater for the Cities of Antioch and Pittsburg, and the unincorporated community of Bay Point located in Contra Costa County. In 1999, DDSD, in cooperation with Calpine Corporation, initiated a project to deliver recycled water from the wastewater treatment plant to two power plants and some park areas within the City of Pittsburg. Recently, there has been increased interest in expanding recycled water use within DDSD's service area in order to:

- **Reduce Dependence on Delta Supplies.** Delta supplies represent the bulk of water used within DDSD's service area. Expanded use of recycled water within this area would offset use of potable water supplies from the Delta.
- **Improve Water Supply Reliability.** Since recycled water is not affected by hydrologic conditions, it provides additional dry-year reliability for irrigation customers and other users.
- **Realize Potential Cost Savings.** DDSD is currently able to produce recycled water at a cost less than $300/AF[1]. Given that raw water supplies are $450/AF and potable municipal supplies within DDSD's service area are upwards of $900/AF, an optimized distribution and storage system for recycled water supply could result in significant cost savings.
- **Reduce Wastewater Discharges**. DDSD currently discharges its wastewater effluent into the New York Slough. With the advent of Total Maximum Daily Load (TMDL) requirements for mercury and other constituents of concern, wastewater dischargers are facing increasingly stringent regulations. Increasing the production of recycled water will help DDSD to comply with these future regulations by reducing the amount of effluent discharged.
- **Better Utilize Existing Recycled Water Facilities.** Currently, there is an underutilization of existing facilities. Expanded recycled water use would make use of available capacity.

The City is working with the DDSD to increase recycled water for use in new areas. A recycled water project was identified and selected as part of Pittsburg/DDSD Recycled Water Project Facilities Plan (March 2005) adoption process. It is currently in design and would provide up to 615 AFY for landscaping use at four City facilities: Delta View Golf Course, City Hall, City Park

[1] This cost includes treatment O&M costs. It does not include distribution O&M costs or capital costs of treatment or distribution.

and Stoneman Park North. These sites use about 615 AFY of domestic water, which would be switched to recycled water upon completion of the project. This project has an estimated cost of $4.3 million. All of the funding necessary for construction of this project has not yet been obtained.

Table 8-4 Recycled Water Program - Summary of Potential Irrigation Demands

ID#	Name / Facility	# of Acres	Estimated Amount Irrigable	# of Irrigated Acres	Annual Water Use (AFY)	CCF / YR
1	Delta View Golf Course			110.0	500.0	217,815
2	Civic Center (City Hall)			6.0	37.0	16,118
3	City Park	23.0	0.5	11.5	52.3	22,783
4	Highlands Park	4.5	0.3	1.4	6.1	2,657
5	Buchanan Park	16.0	0.3	4.8	21.8	9,497
6	Pepertree Park	2.5	0.3	0.8	3.4	1,481
7	Small World Park	8.0	0.15	1.2	5.5	2,396
8	Marina Center Park	2.7	0.3	0.8	3.7	1,612
9	Village Park	1.5	0.3	0.5	2.0	871
10	Central Harbor Park	1.5	0.3	0.5	2.0	871
11	Riverview Park	4.0	0.3	1.2	5.5	2,396
12	Marina Park	15.0	0.3	4.5	20.5	8,930
13	Woodland Hills Park	2.4	0.3	0.7	3.3	1,438
14	Stoneman Park (North)	8.0	0.7	5.6	25.5	11,109
15	De Anza Park	3.5	0.3	1.1	4.8	2,091
16	Americana Park	2.5	0.3	0.8	3.4	1,481
17	Willow Cove Park/Elementary	3.0	0.3	0.8	3.5	1,525
18	California Seasons Park	2.5	0.3	0.8	3.4	1,481
19	Oak Hills Park	5.0	0.3	1.5	6.8	2,962
20	Hillsdale Park	3.5	0.3	1.1	4.8	2,091
21	Marina Walk Park	1.7	0.3	0.5	2.3	1,002
22	La Plazita Park	0.3	0.3	0.1	0.3	131
23	Del Monte Center	2.5	0.3	0.8	3.4	1,481
			Total		**721.3**	**314,220**

Plan for Optimizing the Use of Recycled Water

Recycled water will continue to be a significant, reliable source of supply in the future. The mechanisms encouraging recycled water use include:

- Securing funding from local, state, and federal agencies.
- Promoting partnerships to encourage water recycling projects.
- Urging regulatory agencies to streamline regulatory requirements.
- Supporting research that addresses public concerns on recycled water use, develops new technology for cost reduction, and assesses health effects to protect the public.